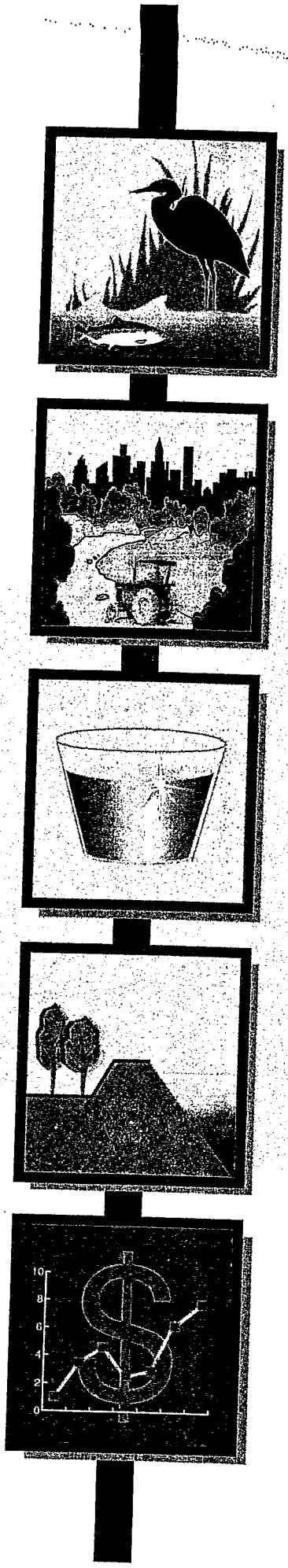

CALFED
BAY-DELTA
PROGRAM

# Affected Environment and Environmental Impacts

## Agricultural Economics

Draft Technical Report
September 1997

CALFED/705

C—001720

C-001720

# CALFED

# DRAFT TECHNICAL REPORT
# AGRICULTURAL ECONOMICS
# AFFECTED ENVIRONMENT

**August 1997**



C-001721

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# AGRICULTURAL ECONOMICS

## 1.0 Summary

**(TO BE PROVIDED)**

## 2.0 Introduction

The purpose of this technical report is to provide a description of the affected environment for resources associated with agricultural economics. In order to accurately describe the affected environment for agricultural economics it will be necessary to define not only the current conditions but also the historical conditions. The historical conditions are described to place current conditions in perspective. The report describes the relevant regulatory context, historical agricultural economics trends, and existing agricultural economics for the study area. The current and historical conditions will be described in this report for each of the five regions within the study area: Delta Region, Bay Region, Sacramento River Region, San Joaquin River Region, and the State Water Project (SWP) and Central Valley Project (CVP) Service Areas. The executive summary contained in this technical report, in conjunction with other information, data, and modeling developed during pre-feasibility analysis, will be used to prepare the "Affected Environment" section of the Programmatic EIR/EIS.

Potential CALFED actions may affect agricultural production both within and outside the Delta. Concerns include water supply within and exported from the Delta, quality of water diverted within and exported from the Delta, water transfers, land purchases for levee protection and for habitat, and water costs. This section will focus on the agricultural economics and land uses, and provide information on some key agricultural indicators used to assess potential CALFED actions, particularly on

- Irrigated and harvested acres,
- Value of agricultural production,
- Cost of production and net income,
- Agricultural water use and water pricing, and
- Farm structure and characteristics

## 3.0 Sources of Information

Agricultural economics and land use data , covering the period of 1920 to 1995, were collected to develop a historical perspective and to describe recent trends and conditions in agricultural production and land use in the CALFED study area. The primary data sources are identified in the following paragraphs.

**County Agricultural Commissioner Reports.** County Agricultural Commissioner (CAC) reports are required by the California Food and Agriculture Code. These reports are published annually and are available from the 1930s to the present for some counties. They provide detailed data on harvested acreage, yield, and value of production for the principal crops produced in each county. These data are collected from county records and visual

surveys. The reports record all harvested acreage (irrigated and dryland) but do not include nonproducing irrigated acreage such as young orchards.

**California Department of Water Resources (DWR) Bulletin 160 Reports.** These reports are published periodically to update California's water plan. Data on irrigated acres by planning subarea were collected from the 1966, 1974, 1983, and 1993 reports. DWR's smallest study area is a detailed analysis unit (DAU), which may coincide with the boundaries of a water service agency or may be defined by hydrologic features. A planning subarea (PSA) is made up of one or more DAUs and is used by the DWR Planning Division for water supply and demand analyses and water use projections.

**U.S. Department of Commerce Census of Agriculture (Census).** These agricultural census reports provide information by county. The data include the number and size of farms, extent of farmlands, cropland acreage, irrigated acreage, types of farm ownership, market value of production, production expenses, and acreage of principal crops. The Census of Agriculture is a legally required report that is sent to each farmer in an area. The data were collected in 1964, 1969, 1978, 1987, and 1992.

**University of California Cooperative Extension Service (CES) Crop Budgets.** The CES has developed budgets for representative crops in many California counties and regions to be used by farmers as guides for making production decisions and determining potential returns. The budgets are based on typical production practices for the area and are detailed and documented.

The agricultural economics data are collected for all five regions defined as the CALFED study area, shown in Figure 1. The study area covers part or all of 39 counties in California. Table 1 shows CALFED regions and counties that are included in each region.

The Delta Region is defined as the statutory Delta in this study, as specified under Section 12220 of the water code. The statutory Delta encompasses six counties: Alameda, Contra Costa, Sacramento, San Joaquin, Solano, and Yolo. Because the Alameda portion is small, it is excluded from this region. No county falls entirely within the statutory Delta. Therefore, Delta "county" data used in this analysis include only the portion of Delta area from each county. They are derived using DWR's Detailed Analysis Units (DAUs) (DWR, 1994) and based on the percentage of cropland (rather than total land) in each "Delta County" located in the statutory Delta. Contra Costa County has the highest percentage (98%), followed by San Joaquin (46%), and Sacramento (45%). Solano County and Yolo County have 30% and 20% of their croplands in the Delta, respectively.

The combined area of the Sacramento River Region and the San Joaquin River Region is often referred to as the "California Central Valley" or the "Central Valley." These terms are used interchangeably in discussions. For simplicity, SWP and CVP Service Area Outside Central Valley is shortened to "the Outside Central Valley Region" in discussions.

Data for more than 200 crops are collected, but they are grouped into 12 crop categories for presentation. Table 2 shows the 12 crop categories and the main crops that are included in each crop category.

Figure 1

| CALFED Region | Grouping of Counties |
|---|---|
| Delta Region | 98% of Contra Costa, 45% of Sacramento, 46% of San Joaquin, 30% of Solano, and 20% of Yolo |
| Bay Region | Alameda, 2% of Contra Costa, Marin, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, and Sonoma |
| Sacramento River Region | Butte, Colusa, Glenn, Placer, 55% of Sacramento, Shasta, 70% of Solano, Sutter, Tehama, 80% of Yolo, and Yuba |
| San Joaquin River Region | Fresno, Kern, King, Madera, Merced, 54% of San Joaquin, Stanislaus, and Tulare |
| SWP and CVP Service Area Outside Central Valley (the Outside Central Valley Region) | Imperial, Los Angeles, Plumas, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura |

**Table 1. CALFED Regions and Grouping of Counties**

| Crop Category | Main Crops Included |
|---|---|
| Pasture | Irrigated pasture |
| Alfalfa Hay | Alfalfa hay |
| Sugar Beets | Sugar beets |
| Other Field Crops | Field corn, dry beans, lima beans, safflower, sunflower, alfalfa seed, wild rice, miscellaneous seed, miscellaneous field crops |
| Rice | Rice |
| Truck Crops | Cantaloupe, honeydew, watermelon, dry and fresh onions, garlic, white potatoes, peppers, carrots, cauliflower, lettuce, peas, spinach, broccoli, asparagus, sweet potatoes, other truck vegetables. |
| Tomatoes | Fresh tomatoes, processing tomatoes |
| Deciduous Orchard | Almonds, pistachios, English walnuts, prunes, plums and apricots, peaches, nectarines, pears, cherries, apples, miscellaneous deciduous fruit |
| Grains | Wheat, barley, oats, sorghum, grain hay, other silage |
| Grapes | Raisins, table grapes, wine grapes |
| Cotton | Upland cotton, pima cotton |
| Subtropical Orchard | Oranges, lemons, grapefruit, olives, figs, Kiwis, avocados, pomegranates, and miscellaneous |

**Table 2. Crop Categories and Main Crops**

## 4.0 Environmental Setting

### 4.1 Study Area

The CALFED study area (Figure 1) represents an important agricultural region for both California and the United States. It is the most diversified agricultural economy in the world, producing more than 250 crop and livestock commodities. The study area encompasses 85 % of the total California irrigated land, covering 39 of the 58 counties in California. In 1995, the 39 counties together contributed about 95 % of California's agricultural production value and represented nine of the top 10 agricultural counties in California and seven of the top 10 counties in the nation. Agriculture in the study area is also an important employer and affects the regional economy through the expenditures of farmers and the processing and transportation of crops harvested.

The study area accounts for almost all of the U.S. production of many fruit and nut crops (e.g., almonds, pistachios, walnuts, nectarines, plums and prunes, dates, figs, kiwi fruit, and olives). In addition, the study area jointly produces about 15% of the total U.S. market value of crop production, 55% of the nation's fruits and nuts, 20% of our cotton, and 55% of U.S. vegetables (Census, 1994). California also has been the nation's leading agricultural export state. The total of $11.72 billion export in 1995 represented 20% of total U.S. agricultural exports (CDFA, 1997). .

### 4.2 Regulatory Context

Laws and regulations affecting California agricultural resources fall into several main categories: water rights permitting, water quality regulation, endangered species and other fish and wildlife protections, and levee maintenance and repair programs. Numerous other regulatory agents influence agriculture (including labor law, and air quality regulations), but this brief description highlights those closely related to potential CALFED actions.

Water diversions in the study area are a mixture of riparian, pre-1914 appropriative, and post-1914 appropriative rights. All of these rights are subject to conditions of reasonable and beneficial use, and the post-1914 rights are subject to State Water Resources Control Board (SWRCB) permits. Particular laws and regulations that have affected agricultural water use in recent years include: SWRCB Decision 1485; the December 1994 Bay-Delta Accord; biological opinions for winter run salmon and Delta smelt; Vernalis water quality standards; and the Central Valley Project Improvement Act (CVPIA) of 1992. The Coordinated Operations Agreement between the State and the U. S. Bureau of Reclamation (Reclamation) currently governs how the SWP and CVP interact in their management and use of Delta water.

Government agencies with responsibility for, or influence on, water use by agriculture include the SWRCB and Central Valley Regional Water Quality Control Board (RWQCB), state and federal water projects that both deliver water within and divert water from the Delta, local irrigation and reclamation districts, state and federal agencies that protect water quality and environmental resources, and the U.S. Army Corps of Engineers (Corps) and local agencies responsible for flood protection and levee maintenance.

## 4.3 Delta Region

### 4.3.1 Historical Perspective

This section provides a discussion of early land development, number of farms, irrigated acres, and agricultural cropping patterns in the Delta Region.

**Early Land Development.** The information on early land development is more aggregated, and the data for individual CALFED study regions are not available. The following discussions are for all regions.

Recorded agriculture in California began with Spanish settlers in the late 1700s. These settlers produced mostly dryland crops adequate for their own needs. Irrigation consisted of a few crude canals to transport water from nearby rivers and streams to the farms. Acreage irrigated at the Spanish missions was small, yet it provided an important object lesson for American and European settlers who began arriving in California in the 1830s and 1840s.

Table 3 shows a chronology of the development of irrigated acreage in the study area by decade. About 1 million acres were irrigated in all of California before 1900. When gold was discovered in the Sierra foothills of northern California in 1848, the mining boom created a new market for agricultural products, and more sophisticated water transportation systems (e.g., reservoirs, ditches, and flumes) were built to mine the gold. These water works were used to supply water for Sacramento Valley irrigation as gold mining activity decreased. Irrigated agriculture began to increase significantly after the mid-1800s, and total irrigated land reached 4.2 million acres by 1920. After the 1920s, large reservoirs were built to capture runoff and store water for irrigation use during longer growing seasons. As a result, total irrigated acres in California increased to 4.3 million acres by 1940 and 6.8 millions acres by 1950.

| Year | Irrigated Acreage (million acres) |
|---|---|
| 1880 | 0.4 |
| 1890 | 1.0 |
| 1900 | 1.4 |
| 1902 | 1.8 |
| 1910 | 3.2 |
| 1920 | 4.2 |
| 1930 | 3.5 |
| 1940 | 4.3 |
| 1950 | 6.8 |

NOTE:

The numbers before 1900 are for all California, and the numbers after 1900 are the sum of the five CALFED regions.

SOURCE:

SWRCB, 1955.

**Table 3. Development of Irrigated Acreage in the Study Area, 1880-1950**

The main factors that affected initial irrigated land development in California are discussed below.

**Surface water, groundwater, and weather conditions.** Although there is virtually no rain during the summer growing season, there are many rivers, streams, and groundwater aquifers in California. Most of the water falls in the northern part of the state. Less than adequate annual precipitation for agriculture, along with frequent droughts and floods, created the

need for water development and flood protection.

**Enactment of the Federal Swamp Act.** Passage of the Federal Swamp Act of 1849 allowed landowners to purchase swamp and overflow lands at a reduced cost and encouraged reclamation of the land for agriculture. Seasonal and periodic flooding was an important incentive for reclamation. In 1880, the State Engineer classified 1.1 million acres in the Sacramento Valley as swamp and overflow lands, with an additional 600,000 acres in the San Joaquin Valley and the Delta. Under the Act, applications to purchase swamp and overflow lands totaled 200,000 acres between 1902 and 1904, with a majority of the land located in Tulare Lake.

**Railroads.** The construction of railroads within the state and the completion of the transcontinental railway allowed California produce to be transported within California and to markets as far away as the eastern United States.

**Increasing Population within California.** The mining boom in the mid-1800s increased the non-farm population, providing the first big market for agricultural products. The non-farm population continued to increase as more industries and settlers moved into California.

**Enactment of the Desert Land Act of 1877.** This act encouraged the development of irrigated agriculture in Kern County. Land within designated areas was purchased, and with proof that irrigation of the land was necessary, water rights were also acquired.

**Availability of Power.** Later, groundwater development began as steam and electric power became available throughout California. Hydropower generation from local water storage projects provided cheap energy for pumping water supplies to irrigation facilities and fields.

**Number of Farms and Irrigated Acres, 1944-1964.** Based on available information, Table 4 shows the number of farms and irrigated acres between 1944 and 1964 in the Delta Region.

| | 1944 | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|---|
| Number of farms | 3,457 | 4,502 | 4,331 | 4,117 | 3,374 |
| Irrigated acres (1,000 acres) | 203 | 334 | 373 | 436 | 445 |

SOURCES:

Census, 1946, 1951, 1956, 1961, and 1966.

**Table 4. Number of Farms and Irrigated Acres, Delta Region, 1944-1964**

The number of farms first increased from 3,457 in 1944 to 4,502 in 1949 in the Delta Region. Then, the number declined to 3,374 in 1964. This was mainly due to the accumulation of irrigated land into fewer and larger farms. As a result, the average farm size in the Delta Region increased from 58 acres in 1944 to 132 acres in 1964.

**Crop Patterns, 1946-1950.** Based on the available data, Table 5 shows average irrigated acres by 12 crop categories in the Delta Region between 1946-1950.

| Crop Category | Irrigated Acres (1,000 acres) |
|---|---|
| Pasture | 62 |
| Alfalfa | 52 |
| Sugar beets | 0 |
| Field crops | 52 |
| Rice | 15 |
| Truck crops | 88 |
| Orchards | 42 |
| Grains | 62 |
| Grapes | 31 |
| Cotton | 0 |
| Subtropical orchards | 1 |
| Total | 402 |

SOURCE:
SWRCB, 1955.

**Table 5. Average Irrigated Acres by Crops Delta Region, 1946-1950**

Truck crops were the dominant crop in the Delta Region, accounting for 22% of the total irrigated acres. Pasture, alfalfa, field crops, and grains each used about the same amount of irrigated acres, accounting for between 10 and 15% of the total irrigated acres. Other major crops grown in the region included grapes and orchards.

### 4.3.2 Current Resource Conditions

This section provides a discussion of agricultural water use and water pricing, recent cropping patterns, and production value in the Delta Region. This section also describes farm profile and agricultural production costs and net revenues.

**California Water Projects in Perspective.** Agriculture in the five CALFED study regions receives irrigation water from the CVP, the SWP, local water rights and water projects, and groundwater. Most of this water is delivered to farmers through irrigation districts and other water agencies. The following sections provide a general description of different types of water used in the CALFED study area. Hence, the discussion is applicable to all five CALFED study regions.

The CVP supplies about 30% of total agricultural water use in the study area (DWR, 1994). Most of CVP water is delivered to the Central Valley counties in the Sacramento River Region and the San Joaquin River Region. CVP water is delivered to approximately 250 water districts, individuals, and companies through water service contracts, Sacramento River water rights, and San Joaquin River exchange contracts. The terms "water service contract" and "project water" refer here to water developed by the project and delivered pursuant to repayment and water service contracts. CVP exchange contracts

and Sacramento River water rights represent water rights that predate the CVP. Deliveries under water rights and exchange water contracts can be reduced in a critical year only, and these contractors must be notified of any shortages by February 15 of each year. (Reclamation defines a critical year as one in which the forecast inflow into Shasta Lake is less than or equal to 3.2 million acre-feet, or a critical year can also be declared based on shortage in the current and previous year.)

CVP's San Felipe Division (SFD) delivers project water to parts of Santa Clara and San Benito counties. The total SFD deliveries averaged about 35,000 acre-feet in recent years. The CVP also makes releases from storage for instream flows, Delta water quality, and other obligations that affect agriculture; CVP power production and flood protection are a benefit to agriculture.

The SWP supplies about 10% of total agricultural water use in the CALFED study area. Through contracts with 29 water agencies, the SWP provides water within the Central Valley to Butte, Solano, Kings, and Kern counties; outside the Central Valley to several Southern California counties; to Alameda and Santa Clara counties in the South Bay Area; and to Napa and Solano counties in the North Bay Area. In addition, the SWP provides water rights deliveries to water rights holders along the Feather River (Butte and Plumas counties).

Local surface water supplies (those not delivered by either project) provide about 40% of all agricultural water supplies in the study area. More local surface water supplies are available on the east side of the valley because of the larger amount of precipitation in the Sierra Nevada. Locally owned water projects are especially important on the Yuba, Stanislaus, Tuolumne, Kings, and Merced rivers; but local sources on the west side (e.g., the federal Solano project) are also important.

Groundwater provides a significant supply in normal years, and it is often used to reduce or eliminate shortages of surface water supplies during drought. On average, groundwater provides about 20% of total agricultural water use in the study area.

Declining groundwater tables, subsidence, and loss of aquifer storage continue to be costly problems, particularly in the western and southern parts of the San Joaquin River Region and the Bay Region, where less surface water is available. Declining groundwater tables increase pumping costs. The costs of subsidence include damage to structures, failure of well casings, and frequent surveying. Water from the CVP and SWP had replaced some of the groundwater pumping, and withdrawals were about equal to estimated recharge (Bertoldi et al., 1991). However, the recent drought and supply restrictions imposed by the CVPIA of 1992, the Bay-Delta Accord, and Biological Opinions have reduced surface water supplies and renewed the past trend of groundwater depletion throughout the valley.

**Agricultural Water Use And Pricing.** Table 6 shows average agricultural applied water use and water prices between 1985-1990 in the Delta Region.

Most agricultural water users in the Delta are private water right holders. Local water rights water accounts for over 85% of the total irrigation water use. Other irrigation water sources in the Delta Region are CVP water and ground water, each accounting for about 5-10% of the total agricultural water uses.

| Water Source | Irrigation Applied Water Use (1,000 af) |
|---|---|
| Local water | 1,100 |
| CVP water | 85 |
| SWP water | 0 |
| Groundwater | 110 |
| | **Weighted Average Price ($/af)** |
| Surface water | 0-15 |
| Groundwater | 20-35 |

SOURCE:
DWR, 1994

**Table 6. Agricultural Water Use and Water Pricing Delta Region, 1985-1990**

Table 6 also gives 1985-1990 weighted-average water prices for surface water and groundwater in the Delta Region. Compared with other parts of California, the cost of water is much cheaper in the Delta Region because of large amounts of local riparian and pre-1914 appropriate water rights.

Many districts recover part or all of their costs from per-acre assessments in addition to, or instead of, per acre-foot water charges. These assessments are not included in the prices summarized here. In addition, under section 3407(d) of the CVPIA of 1992 , CVP service contracts water is charged $6 per acre-feet to the restoration fund , with an additional $7 per acre-foot charged to CVP Friant-Kern water deliveries. However, contractors can be excused from part or all of restoration charges based on ability to pay. These costs and adjustments are not included in the prices discussed above.

**Cropping Patterns and Production Value.** A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land. Agricultural land use can be partially described by its cropping pattern, and cropping patterns are important to agricultural and regional economics. If CALFED actions reduce the amount of irrigation water available, farmers can change their cropping patterns by fallowing a portion of the lands that receive Delta export water, by planting crops that require less irrigation water, or by adopting water conservation measures. All three options would affect farm profits. The extent of the impact would depend on the change in the amount of water used, the cost of producing the new crops, the prices received for the new crops, and the costs of implementing water conserva-tion measures, such as more efficient irrigation systems.

Table 7 presents average harvested acres and gross production value by 12 crop categories in the Delta Region for 1986-1995.

Field crops dominate Delta crop production, accounting for 30% of the region's total harvested acres. The next important group of crops in the region include alfalfa, grains, and orchards, each accounting for 10-15% of the total crop acreage. Other main crops grown in the region include tomatoes, irrigated pasture, and grapes.

Orchards and grapes together accounted for less than 20% of the total harvest acreage in the Delta between 1986-1995, but produced about 50% of the total production value, reflecting high crop values per acre. Alfalfa and field crops produced about 15% of total production value, with more than 40% of total harvested acres, indicating lower crop values per acre.

| Crop Category | Irrigated Acres (1,000 acres) | Production Value (million dollars) |
|---|---|---|
| Pasture | 37 | 4 |
| Rice | 11 | 9 |
| Truck crops | 28 | 77 |
| Tomatoes | 45 | 91 |
| Alfalfa | 65 | 37 |
| Sugar beets | 15 | 13 |
| Field crops | 151 | 76 |
| Orchards | 61 | 177 |
| Grains | 60 | 16 |
| Grapes | 36 | 127 |
| Cotton | 0 | 0 |
| Subtropical orchards | 0 | 0 |
| Total | 509 | 628 |

SOURCES:

CAC reports, various years.

**Table 7. Average Harvested Acres and Production Value Delta Region, 1986-1995**

**Farm Profiles.** Numbers and sizes of farms, together with ownership patterns, describe the general structure of agriculture within a region. A large number of farms can mean larger economic influences within the region in terms of employment, spending, and taxes. Ownership patterns can give an indication of the numbers of farm owners and managers who live within a region. Labor expenses are important to workers and the communities in which they live. Data on these factors are provided by the Census of Agriculture. Table 8 shows farm numbers, farm size, and farm ownership in the Delta Region for 1987 and 1992.

The number of farms decreased from 4,033 in 1987 to 3,639 in 1992 in the Delta Region. The decline was partly due to loss of farm land (62,000 acres) to industrial and urban uses, and partly to the accumulation of farm land into fewer and larger farms. The average farm size increased from 238 acres to 247 acres during this period.

About 70% of farms in the Delta are operated by full owners, 17% by part owners, and 13% by tenants. Little change occurs in these numbers between 1987 and 1992.

**Agricultural Production Costs and Revenues.** Agricultural net returns are revenues less costs. Higher costs reduce farm profits, but some part of costs also represent farm expenditures in the regional economy. Revenues are price times production. Farms in the Delta Region achieved $496 million in agricultural sales in 1987 and $590 million in 1992, as shown in Table 9. About two-thirds of these sales were receipts for crops. The remainder of the sales were mostly livestock products. Farmers received an additional $10 million in government payments and direct sales, custom work, and other farm services in 1992.

Production expenses were about $474 million in 1992, leaving a net cash return of $126 million. Net cash return includes the payment for family labor, management, returns to land and water, risk, and some other uncounted costs of farming. Hired and contract labor was the largest expense reported, accounting for one-fourth of total expenses, and it has been increasing over time. Other large categories (other than livestock-related expenses) were fertilizers and chemicals, petroleum products and electricity, and interest paid.

| | Number and Size | | | Ownership Status | | |
|---|---|---|---|---|---|---|
| Year | Number of Farms | Land in Farms (1,000 acres) | Average Farm Size (acres) | Full Owners | Part Owners | Tenants |
| 1987 | 4,033 | 962 | 238 | 2,817 | 691 | 529 |
| 1992 | 3,639 | 900 | 247 | 2,525 | 628 | 487 |

SOURCES:

Census, 1989 and 1994.

**Table 8. Number of Farms, Farm Sizes, and Farm Ownership, Delta Region, 1987 and 1992**

| | Total Farm Income (million dolars) | | | | Total Production Expenses (million dollars) | | | | Net Cash Return (million dollars) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Agric. Product Value | Other Revenue | Total | Livestock Related | Fertilizers and Chemicals | Hired and Contract Labor | Other | Total | |
| 1987 | 496 | 12 | 508 | 81 | 38 | 97 | 169 | 385 | 123 |
| 1992 | 590 | 10 | 600 | 89 | 48 | 128 | 209 | 474 | 126 |

SOURCES:

Census, 1989 and 1994.

**Table 9. Farm Income and Production Expenses, Delta Region, 1987 and 1992**

| | 1944 | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|---|
| Number of farms | 5,581 | 5,713 | 6,146 | 5,347 | 4,103 |
| Irrigated acres (1,000 acres) | 169 | 200 | 223 | 236 | 210 |

SOURCES:

Census, 1946, 1951, 1956, 1961, and 1966.

**Table 10. Number of Farms and Irrigated Acres, Bay Region, 1944-1964**

## 4.4 Bay Region

### 4.4.1 Historical Perspective

This section provides a discussion of irrigated acres and agricultural cropping patterns in the Bay Region. The discussions of early land development in this region are the same as those described in the Delta Region.

**Number of Farms And Irrigated Acres, 1944-1964.** Based on available information, Table 10 shows the number of farms and irrigated acres between 1944 and 1964 in the Bay Region.

The number of farms increased from 5,581 in 1944 to 6,146 in 1954 in the Bay Region. Then, it declined to 4,103 in 1964. This was partly due to the accumulation of irrigated land into fewer and larger farms. As a result, the average farm size in the region increased from 30 acres in 1944 to 51 acres in 1964. Another reason of fewer farms was caused by the loss of farm land to urban encroachment (DWR, 1955). Between 1959 and 1964, 27,000 acres of irrigated crop land were lost to non-agricultural land use, mostly to industrial and urban uses.

**Crop Patterns, 1946-1950.** Based on the available data, Table 11 shows average irrigated acres by 12 crop categories in the Bay Region between 1946 and 1950.

Orchards were by far the most important crop in the Bay Region, accounting for 47% of the total irrigated acres. The next important crop in the region was truck crops, accounting for 25 % of the total irrigated acres. Other crops grown in the region included pasture, alfalfa, sugar beets, and field crops.

| Crop Category | Irrigated Acres (1,000 acres) |
|---|---|
| Pasture | 17 |
| Alfalfa | 9 |
| Sugar beets | 17 |
| Field crops | 21 |
| Rice | 0 |
| Truck crops | 61 |
| Orchards | 115 |
| Grains | 2 |
| Grapes | 6 |
| Cotton | 0 |
| Subtropical orchards | 0 |
| Total | 247 |

SOURCE:
DWR, 1955.

**Table 11. Average Irrigated Acres by Crops Bay Region, 1946-1950**

### 4.4.2 Current Resource Conditions

This section provides a discussion of agricultural water use and water pricing, recent cropping patterns, and production value in the Bay Region. This section also describes farm profile and agricultural production costs and net revenues.

**Agricultural Water Use and Pricing.** Table 12 shows average agricultural applied water use and water prices between 1985 and 1990 in the Bay Region.

Over 75% of irrigation water sources in the Bay Region are from groundwater pumping. Local water and project water make up the other 25%. With limited surface supply and few surface water storage facilities in this region, the growing demand for water places an increased dependence on groundwater

pumping. As ground water extractions exceed groundwater replenishment, many of the region's aquifers are experiencing overdraft conditions (DWR, 1994).

| Water Source | Irrigation Applied Water Use (1,000 af) |
|---|---|
| Local water | 123 |
| CVP water | 54 |
| SWP water | 13 |
| Groundwater | 544 |
| | **Weighted Average Price ($/af)** |
| Surface water | 15-45 |
| Groundwater | 60-130 |

SOURCE:
DWR, 1994.

**Table 12. Agricultural Water Use and Water Pricing Bay Region, 1985-1990**

Table 12 also gives 1985-1990 weighted average water prices for surface water and groundwater in the Bay Region. The average cost of surface water in this region is estimated at $15-45 per acre-foot, which is about the average in California. But the cost of groundwater in the Bay Region is much higher ($60-130 per acre-foot) compared with the Delta and Sacramento River Regions.

Many districts recover part or all of their costs from per-acre assessments in addition to, or instead of, per-acre-foot water charges. These assessments are not included in the prices summarized here. Also not included in the above prices is the potential CVPIA restoration fund charges to CVP service contract water users.

**Cropping Patterns And Production Value.** A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land. If CALFED actions reduce the amount of irrigation water available, farmers can change their cropping patterns by fallowing a portion of the lands that receive Delta export water, by planting crops that require less irrigation water, or by adopting water conservation measures.

Table 13 presents average harvested acres and gross production value by 12 crop categories in the Bay Region for 1986-1995.

Grapes are the dominant crop in the Bay Region, accounting for 30% of the region's total harvested acres. The next important group of crops in the region is sugar beets and truck crops, each accounting for about 20% of the total crop acreage. Other main crops grown in the region include orchards, irrigated pasture, and field crops.

Grapes and orchards together accounted for less than 50% of the total harvest acreage in the Bay Region but produced about 80% of the total production value, reflecting high crop values per acre. Alfalfa, grains, and field crops produced about 2% of total production value, with more than 35% of total harvested acres, indicating lower crop values per acre.

**Farm Profiles.** Numbers and sizes of farms, together with ownership patterns, describe the general structure of agriculture within a region. Table 14 shows farm numbers, farm size, and farm ownership in the Bay Region for 1987 and 1992.

| Crop Category | Irrigated Acres (1,000 acres) | Production Value (million dollars) |
|---|---|---|
| Pasture | 15 | 2 |
| Alfalfa | 50 | 9 |
| Sugar beets | 0 | 0 |
| Field crops | 16 | 10 |
| Rice | 0 | 0 |
| Truck crops | 47 | 280 |
| Tomatoes | 4 | 10 |
| Orchards | 26 | 148 |
| Grains | 14 | 3 |
| Grapes | 70 | 316 |
| Cotton | 0 | 0 |
| Subtropical orchards | 0 | 0 |
| Total | 244 | 779 |

SOURCES:

CAC reports, various years.

**Table 13. Average Harvested Acres and Production Value, Bay Region, 1986-1995**

The number of farms decreased from 8,377 in 1987 to 7,453 in 1992 in the Bay Region. The decline was partly due to loss of farm land (54,000 acres) to industrial and urban uses, and partly to the accumulation of farm land into fewer and larger farms. The average farm size increased from 276 acres to 303 acres during this period.

About 70% of farms in the Bay Region are operated by full owners, 17% by part owners, and 13% by tenants. Little change occurs in these numbers between 1987 and 1992.

**Agricultural Production Costs and Revenues.** Agricultural net returns are revenues less costs. Higher costs reduce farm profits, but some part of costs also represent farm expenditures in the regional economy. Revenues are price times production. Farms in the Bay Region achieved $845 million in agricultural sales in 1987 and $1,065 million in 1992, as shown in Table 15. About two-thirds of these sales were receipts for crops. The remainder of the sales were mostly livestock products. Farmers received an additional $6 million in government payments and direct sales, custom work, and other farm services in 1992.

Production expenses were about $831 million in 1992, leaving a net cash return of $240 million. Net cash return includes the payment for family labor, management, returns to land and water, risk, and some other uncounted costs of farming. Hired and contract labor was the largest expense reported, accounting for about 40% of total expenses, and it has been increasing over time. Other large categories (other than livestock-related expenses) were fertilizers and chemicals, petroleum products and electricity, and interest paid.

## 4.5 Sacramento River Region

### 4.5.1 Historical Perspective

This section provides a discussion of number of farms, irrigated acres, and agricultural cropping patterns in the Sacramento River Region. The discussions of early land development in this region are the same as those described in the Delta Region.

**Number of Farms and Irrigated Acres, 1944-1964.** Based on available information, Table 16 shows the number of farms and irrigated acres between 1944 and 1964 in the Sacramento River Region.

| | Number and Size | | | Ownership Status | | |
|---|---|---|---|---|---|---|
| Year | Number of Farms | Land in Farms (1,000 acres) | Average Farm Size (acres) | Full Owners | Part Owners | Tenants |
| 1987 | 8,377 | 2,315 | 276 | 5,950 | 1,194 | 1,233 |
| 1992 | 7,453 | 2,261 | 303 | 5,306 | 1,035 | 1,112 |

SOURCES:

Census, 1989 and 1994.

**Table 14. Number of Farms, Farm Sizes, and Farm Ownership, Bay Region, 1987 and 1992**

| | Total Farm Income (million dollars) | | | Total Production Expenses (million dollars) | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Agric. Product Value | Other Revenue | Total | Livestock Related | Fertilizers and Chemicals | Hired and Contract Labor | Other | Total | Net Cash Return (million dollars) |
| 1987 | 845 | 2 | 847 | 102 | 36 | 255 | 281 | 674 | 173 |
| 1992 | 1,065 | 6 | 1,071 | 105 | 53 | 338 | 335 | 831 | 240 |

SOURCES:

Census, 1989 and 1994.

**Table 15. Farm Income and Production Expenses, Bay Region, 1987 and 1992**

| | 1944 | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|---|
| Number of farms | 9,948 | 11,068 | 11,538 | 10,899 | 9,255 |
| Irrigated acres (1,000 acres) | 640 | 866 | 1,100 | 1,155 | 1,281 |

SOURCES:

Census, 1946, 1951, 1956, 1961, and 1966.

**Table 16. Number of Farms and Irrigated Acres In Sacramento River Region, 1944-1964**

The number of farms increased from 9,948 in 1944 to 11,538 in 1954 in the Sacramento River Region. Then, it declined to 9,255 in 1964. This was mainly due to the accumulation of irrigated land into fewer and larger farms. As a result, the average farm size in the region increased from 64 acres in 1944 to 138 acres in 1964.

**Crop Patterns, 1946-1950.** Based on the available data, Table 17 shows average irrigated acres by 12 crop categories in the Sacramento River Region between 1946 and 1950.

| Crop Category | Irrigated Acres (1,000 acres) |
|---|---|
| Pasture | 179 |
| Alfalfa | 86 |
| Sugar beets | 0 |
| Field crops | 127 |
| Rice | 258 |
| Truck crops | 49 |
| Orchards | 161 |
| Grains | 35 |
| Grapes | 8 |
| Cotton | 0 |
| Subtropical orchards | 2 |
| Total | 904 |

SOURCE:
DWR, 1955.

**Table 17. Average Irrigated Acres by Crops, Sacramento River Region, 1946-1950**

Rice was the most important crop in the Sacramento River Region, accounting for 30% of the total irrigated acres. Almost 90% of California rice crops were grown in this region during the 1946-1950 period. The next important crops in the Sacramento River Region were irrigated pasture and orchards, each accounting for 20% of the total irrigated acres. Other crops grown in the region included alfalfa, field crops, grains, and truck crops.

### 4.5.2 Current Resource Conditions

This section provides a discussion of agricultural water use and water pricing, recent cropping patterns, and production value in the Sacramento River Region. This section also describes farm profile and agricultural production costs and net revenues.

**Agricultural Water Use And Pricing.** Table 18 shows average agricultural applied water use and water prices between 1985 and 1990 in the Sacramento River Region.

About 40% of irrigation water sources in the Sacramento River Region are from local water rights or local water projects. CVP project water and groundwater each makes up the rest of the total agricultural water uses. The 30% of the region's lands that are irrigated with groundwater generally have a very reliable supply (DWR, 1994). Groundwater levels may decline moderately during an extended drought, but the main result is a modest drop in well production.

The majority of diverters along the Sacramento and Feather rivers existed before major CVP and SWP reservoirs were built. Many agricultural water users in this region use their Sacramento River and Feather River water rights water with Reclamation and DWR. They do not pay for

their water rights water. Table 12 provides 1985-1990 weighted average water prices for surface water and groundwater in the Sacramento River Region. The average cost of surface water in this region is estimated at $0-15 per acre-foot, among the lowest in California. The cost of groundwater is estimated at $30-60 per acre-foot, also among the lowest in the state.

| Water Source | Irrigation Applied Water Use (1,000 af) |
|---|---|
| Local water | 1,801 |
| CVP water | 1,467 |
| SWP water | 1 |
| Groundwater | 1,448 |
| | **Weighted Average Price ($/af)** |
| Surface water | 0-15 |
| Groundwater | 30-60 |

SOURCE:
DWR, 1994.

**Table 18. Agricultural Water Use and Water Pricing, Sacramento River Region, 1985-1990**

Many districts recover part or all of their costs from per-acre assessments in addition to, or instead of, per-acre-foot water charges. These assessments are not included in the prices summarized here. Also not included in the above prices is the potential CVPIA restoration fund charges to CVP service contract water users.

**Cropping Patterns And Production Value.** A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land. If CALFED actions reduce the amount of irrigation water available, farmers can change their cropping patterns by fallowing a portion of the lands that receive Delta export water, by planting crops that require less irrigation water, or by adopting water conservation measures.

Table 19 presents average harvested acres and gross production value by 12 crop categories in the Sacramento River Region for 1986-1995.

| Crop Category | Irrigated Acres (1,000 acres) | Production Value (million dollars) |
|---|---|---|
| Pasture | 189 | 19 |
| Alfalfa | 161 | 68 |
| Sugar beets | 28 | 25 |
| Field crops | 335 | 176 |
| Rice | 469 | 394 |
| Truck crops | 16 | 31 |
| Tomatoes | 135 | 234 |
| Orchards | 265 | 578 |
| Grains | 175 | 43 |
| Grapes | 10 | 42 |
| Cotton | 4 | 2 |
| Subtropical orchards | 15 | 30 |
| Total | 1,803 | 1,642 |

SOURCES:
CAC reports, various years.

**Table 19. Average Harvested Acres and Production Value, Sacramento River Region, 1986-1995**

Rice is the number one crop in the Sacramento River Region, accounting for

26% of the region's total harvested acres. The next important group of crops in the region includes field crops (19%), orchards (15%), pasture (11%), and grains (10%). Other main crops grown in the region include alfalfa, tomatoes, and sugar beets.

Orchards and tomatoes together accounted for less than 25% of the total harvest acreage in this region but produced about 50% of the total production value, reflecting high crop values per acre. Pasture, alfalfa, grains, and field crops produced less than 20% of total production value, with more than 50% of total harvested acres, indicating lower crop values per acre.

**Farm Profiles.** Numbers and sizes of farms, together with ownership patterns, describe the general structure of agriculture within a region. Table 20 shows farm numbers, farm size, and farm ownership in the Sacramento River Region for 1987 and 1992.

Table 20 shows that the number of farms decreased from 11,916 in 1987 to 11,507 in 1992 in the Sacramento River Region. The decline was primarily due to loss of farm land (193,000 acres) to industrial and urban uses. The average farm size remained about the same during this period.

About 70% of farms in the Sacramento River Region are operated by full owners, 18 % by part owners, and 12% by tenants. Little change occurs in these numbers between 1987 and 1992.

**Agricultural Production Costs And Revenues.** Agricultural net returns are revenues less costs. Higher costs reduce farm profits, but some part of costs also represent farm expenditures in the regional economy. Revenues are price times production. Farms in the Sacramento River Region achieved $1,515 million in agricultural sales in 1987 and $1,349 million in 1992, as shown in Table 21. About two-thirds of these sales were receipts for crops. The remainder of the sales were mostly livestock products. Farmers received an additional $183 million in government payments and direct sales, custom work, and other farm services in 1992.

Production expenses were about $630 million in 1992, leaving a net cash return of $304 million. Net cash return includes the payment for family labor, management, returns to land and water, risk, and some other uncounted costs of farming. Hired and contract labor was the largest expense reported, accounting for about 25% of total expenses, and it has been increasing over time. Other large categories (other than livestock-related expenses) were fertilizers and chemicals, petroleum products and electricity, and interest paid.

## 4.6 San Joaquin River Region

### 4.6.1 Historical Perspective

This section provides a discussion of number of farms, irrigated acres, and agricultural cropping patterns in the San Joaquin River Region. The discussions of early land development in this region are the same as those described in the Delta Region.

**Number of Farms And Irrigated Acres, 1944-1964.** Based on available information, Table 22 shows the number of farms and irrigated acres between 1944 and 1964 in the San Joaquin River Region.

The number of farms increased from 30,212 in 1944 to 33,832 in 1949 in the San Joaquin River Region. Then, it declined to 25,153 in 1964. This was mainly due to the accumulation of irrigated land into fewer and larger farms. As a result, the average farm size in the region increased from 78 acres in 1944 to 155 acres in 1964.

| | Number and Size | | | Ownership Status | | |
|---|---|---|---|---|---|---|
| Year | Number of Farms | Land in Farms (1,000 acres) | Average Farm Size (acres) | Full Owners | Part Owners | Tenants |
| 1987 | 11,916 | 4,527 | 380 | 8,183 | 2,160 | 1,568 |
| 1992 | 11,507 | 4,334 | 377 | 7,786 | 2,093 | 1,629 |

SOURCES:

Census, 1989 and 1994.

**Table 20. Number of Farms, Farm Sizes, and Farm Ownership, Sacramento River Region, 1987 and 1992**

| | Total Farm Income (million dollars) | | | Total Production Expenses (million dollars) | | | | | Net Cash Return (million dollars) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Agric. Product Value | Other Revenue | Total | Livestock Related | Fertilizers and Chemicals | Hired and Contract Labor | Other | Total | |
| 1987 | 1,515 | 145 | 1,660 | 126 | 140 | 252 | 525 | 1,043 | 617 |
| 1992 | 1,394 | 183 | 1,577 | 147 | 180 | 316 | 630 | 1,273 | 304 |

SOURCES:

Census, 1989 and 1994.

**Table 21. Farm Income and Production Expenses, Sacramento River Region, 1987 and 1992**

| | 1944 | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|---|
| Number of farms | 30,212 | 33,832 | 32,037 | 29,327 | 25,153 |
| Irrigated acres (1,000 acres) | 2,367 | 3,208 | 3,526 | 3,744 | 3,893 |

SOURCES:

Census, 1946, 1951, 1956, 1961, and 1966.

**Table 22. Number of Farms and Irrigated Acres, San Joaquin River Region, 1944-1964**





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**Crop Patterns, 1946-1950.** Based on the available data, Table 23 shows average irrigated acres by 12 crop categories in the San Joaquin River Region between 1946 and 1950.

| Crop Category | Irrigated Acres (1,000 acres) |
|---|---|
| Pasture | 443 |
| Alfalfa | 439 |
| Sugar beets | 0 |
| Field crops | 130 |
| Rice | 23 |
| Truck crops | 210 |
| Orchards | 181 |
| Grains | 662 |
| Grapes | 410 |
| Cotton | 723 |
| Subtropical orchards | 42 |
| Total | 3,262 |

SOURCE:
DWR, 1955.

**Table 23. Average Irrigated Acres by Crops, San Joaquin River Region, 1946-1950**

In terms of irrigated acres, cotton and grains were the most important crops in the San Joaquin River Region, accounting for 22% and 20% of the total irrigated acres, respectively. The next important crops in the San Joaquin River Region were irrigated pasture, alfalfa and grapes, each accounting for about 15% of the total irrigated acres. Other crops grown in the region included orchards, field crops, and truck crops. The San Joaquin River Region was is the largest region, and many of its crops accounted for large shares in the total state production. For example, almost 100% of California cotton and 90% California grapes were grown in this region during the 1964-1950 period.

### 4.6.2 Current Resource Conditions

This section provides a discussion of agricultural water use and water pricing, recent cropping patterns, and production value in the San Joaquin River Region. This section also describes farm profile and agricultural production costs and net revenues.

**Agricultural Water Use And Pricing.** Table 24 shows average agricultural applied water use and water prices between 1985 and 1990 in the San Joaquin River Region.

| Water Source | Irrigation Applied Water Use (1,000 af) |
|---|---|
| Local water | 4,854 |
| CVP water | 4,268 |
| SWP water | 1,168 |
| Groundwater | 1,803 |
| | **Weighted Average Price ($/af)** |
| Surface water | 20-85 |
| Groundwater | 30-80 |

SOURCE:
DWR, 1994.

**Table 24. Agricultural Water Use and Water Pricing, San Joaquin River Region, 1985-1990**

About 40% of irrigation water sources in the San Joaquin River Region are from local

water rights or local water projects. CVP project water provides 35% of total irrigation water uses, mostly to the Westlands Water District. The rest of water in the region is from SWP and groundwater pumping.

Table 24 provides 1985-1990 weighted average water prices for surface water and groundwater in the San Joaquin River Region. The average cost of surface water in this region is estimated at $20-85 per acre-foot, among the high end in California. The cost of groundwater is estimated at $30-80 per acre-foot, also among the high end in the state.

Many districts recover part or all of their costs from per-acre assessments in addition to, or instead of, per-acre-foot water charges. These assessments are not included in the prices summarized here. Also not included in the above prices is the potential CVPIA restoration fund charge to CVP service contracts water users.

**Cropping Patterns And Production Value.** A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land. If CALFED actions reduce the amount of irrigation water available, farmers can change their cropping patterns by fallowing a portion of the lands that receive Delta export water, by planting crops that require less irrigation water, or by adopting water conservation measures.

Table 25 presents average harvested acres and gross production value by 12 crop categories in the San Joaquin River Region for 1986-1995.

| Crop Category | Irrigated Acres (1,000 acres) | Production Value (million dollars) |
|---|---|---|
| Pasture | 290 | 34 |
| Alfalfa | 527 | 374 |
| Sugar beets | 51 | 54 |
| Field crops | 786 | 532 |
| Rice | 18 | 12 |
| Truck crops | 301 | 982 |
| Tomatoes | 180 | 433 |
| Orchards | 668 | 2,074 |
| Grains | 344 | 103 |
| Grapes | 507 | 1,681 |
| Cotton | 1,269 | 1,153 |
| Subtropical orchards | 221 | 973 |
| Total | 5,162 | 8,403 |

SOURCES:

CAC reports, various years.

**Table 25. Average Harvested Acres and Production Value, San Joaquin River Region, 1986-1995**

In terms of harvested acres, cotton is the number one crop in the San Joaquin River Region, accounting for 25% of the region's total harvested acres. The next important crops in the region are field crops (15%), orchards (13%), grapes (10%), and alfalfa (10%). Other main crops grown in the region include pasture, truck crops, tomatoes, and grains.

Grapes and orchards together accounted for less than 25% of the total harvest acreage in this region but produced about 50% of the total production value, reflecting high crop values per acre. On the contrary, pasture, alfalfa, grains, and field crops produced less than 20% of total production value with more than 50% of total harvested acres, indicating lower crop values per acre.

**Farm Profiles.** Numbers and sizes of farms, together with ownership patterns, describe the general structure of agriculture within a region. Table 26 shows farm numbers, farm size, and farm ownership in the San Joaquin River Region for 1987 and 1992.

The number of farms decreased from 28,742 in 1987 to 26,731 in 1992 in the San Joaquin River Region. The decline was partly due to loss of farm land (439,000 acres) to industrial and urban uses, and partly due to the accumulation of farm land into fewer and larger farms. The average farm size increased from 351 acres to 361 acres during this period.

About 73% of farms in the San Joaquin River Region are operated by full owners, 17% by part owners, and 10% by tenants. Little change occurs in these numbers between 1987 and 1992.

**Agricultural Production Costs And Revenues.** Agricultural net returns are revenues less costs. Higher costs reduce farm profits, but some part of costs also represent farm expenditures in the regional economy. Revenues are price times production. Farms in the San Joaquin River Region achieved $6,565 million in agricultural sales in 1987 and $8,089 million in 1992, as shown in Table 27. About two-thirds of these sales were receipts for crops. The remainder of the sales were mostly livestock products. Farmers received an additional $308 million in government payments and direct sales, custom work, and other farm services in 1992.

Production expenses were about $2,736 million in 1992, leaving a net cash return of $1,520 million. Net cash return includes the payment for family labor, management, returns to land and water, risk, and some other uncounted costs of farming. Hired and contract labor was the largest expense reported, accounting for about 25% of total expenses, and it has been increasing over time. Other large categories (other than livestock-related expenses) were fertilizers and chemicals, petroleum products and electricity, and interest paid.

## 4.7 Other SWP Service Areas

### 4.7.1 Historical Perspective

This section provides a discussion of number of farms, irrigated acres, and agricultural cropping patterns in the Outside Central Valley Region. The discussions of early land development in this region are the same as those described in the Delta Region.

**Number of Farms and Irrigated Acres, 1944-1964.** Based on available information, Table 28 shows the number of farms and irrigated acres between 1944 and 1964 in the Outside Central Valley Region.

The number of farms decreased from 33,715 in 1944 to 13,603 in 1964 in the Outside Central Valley Region. This was mainly due to the accumulation of irrigated land into fewer and larger farms. As a result, the average farm size in the region increased from 30 acres in 1944 to 82 acres in 1964.

**Crop Patterns, 1946-1950.** Based on the available data, Table 29 shows average irrigated acres by 12 crop categories in the Outside Central Valley Region between 1946 and 1950.

In terms of irrigated acres, alfalfa and subtropical orchards were the most important crops in the Outside Central Valley Region, accounting for 24% and 22% of the total irrigated acres, respectively. The

| | Number and Size | | | Ownership Status | | |
|---|---|---|---|---|---|---|
| Year | Number of Farms | Land in Farms (1,000 acres) | Average Farm Size (acres) | Full Owners | Part Owners | Tenants |
| 1987 | 28,742 | 10,095 | 351 | 20,942 | 4,610 | 3,730 |
| 1992 | 26,731 | 9,656 | 361 | 9,144 | 4,420 | 3,168 |

SOURCES:

Census, 1989 and 1994.

**Table 26. Number of Farms, Farm Sizes, and Farm Ownership, San Joaquin River Region, 1987 and 1992**

| | Total Farm Income (million dollars) | | | Total Production Expenses (million dollars) | | | | | Net Cash Return (million dollars) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Agric. Product Value | Other Revenue | Total | Livestock Related | Fertilizers and Chemicals | Hired and Contract Labor | Other | Total | |
| 1987 | 6,565 | 222 | 6,787 | 1,276 | 531 | 1,337 | 2,197 | 5,341 | 1,446 |
| 1992 | 8,089 | 308 | 8397 | 1,780 | 670 | 1,691 | 2,736 | 6,877 | 1,520 |

SOURCES:

Census, 1989 and 1994.

**Table 27. Farm Income and Production Expenses, San Joaquin River Region, 1987 and 1992**

| | 1944 | 1949 | 1954 | 1959 | 1964 |
|---|---|---|---|---|---|
| Number of farms | 33,715 | 30,780 | 25,548 | 19,554 | 13,603 |
| Irrigated acres (1,000 acres) | 1,026 | 1,268 | 1,234 | 1,193 | 1,124 |

SOURCES:

Census, 1946, 1951, 1956, 1961, and 1966.

**Table 28. Number of Farms and Irrigated Acres, Outside Central Valley Region, 1944-1964**

next important crops in the Outside Central Valley Region were truck crops, field crops, and grains, each accounting for about 15-20% of the total irrigated acres. Other crops grown in the region included pasture and orchards. Over 90% of California subtropical orchards were grown in this region during the 1964-1950 period.

| Crop Category | Irrigated Acres (1,000 acres) |
|---|---|
| Pasture | 59 |
| Alfalfa | 325 |
| Sugar beets | 34 |
| Field crops | 152 |
| Rice | 0 |
| Truck crops | 253 |
| Orchards | 79 |
| Grains | 126 |
| Grapes | 10 |
| Cotton | 34 |
| Subtropical orchards | 294 |
| Total | 1,366 |

SOURCE:
DWR, 1955.

**Table 29. Average Irrigated Acres by Crops, Outside Central Valley Region, 1946-1950**

### 4.7.2 Current Resource Conditions

This section provides a discussion of agricultural water use and water pricing, recent cropping patterns, and production value in the Outside Central Valley Region. This section also describes farm profile and agricultural production costs and net revenues.

**Agricultural Water Use And Pricing.** Table 30 shows average agricultural applied water use and water prices between 1985-1990 in the Outside Central Valley Region.

| Water Source | Irrigation Applied Water Use (1,000 af) |
|---|---|
| Local water | 107 |
| CVP water | 0 |
| SWP water | 232 |
| Groundwater | 229 |
| | **Weighted Average Price ($/af)** |
| Surface water | 15-255 |
| Groundwater | 80-120 |

SOURCE:
DWR, 1994.

**Table 30. Agricultural Water Use and Water Pricing, Outside Central Valley Region, 1985-1990**

SWP and groundwater each provides 40% of total irrigation water in the Outside Central Valley Region. Local water provides the rest of total irrigation water uses.

Table 30 provides 1985-1990 weighted average water prices for surface water and groundwater in the Outside Central Valley Region. The average cost of surface water in this region is estimated at $15-255 per acre-foot, among the highest in California. The cost of groundwater is estimated at $80-120 per acre-foot, also among the highest in the state.

Many districts recover part or all of their costs from per-acre assessments in addition to, or instead of, per-acre-foot water charges. These assessments are not included in the prices summarized here. Also not included in the above prices is the potential CVPIA restoration fund charge to CVP service contracts water users.

**Cropping Patterns and Production Value.** A cropping pattern is the share of acres within a region planted to individual crops or categories of crops, including fallowed land.

Table 31 presents average harvested acres and gross production value by 12 crop categories in the Outside Central Valley Region for 1986-1995.

| Crop Category | Irrigated Acres (1,000 acres) | Production Value (million dollars) |
|---|---|---|
| Pasture | 185 | 15 |
| Alfalfa | 420 | 258 |
| ,Sugar beets | ,32 | 40 |
| Field crops | 154 | 67 |
| Rice | 0 | 0 |
| Truck crops | 289 | 1,514 |
| Tomatoes | 8 | 47 |
| Orchards | 22 | 343 |
| Grains | 146 | 47 |
| Grapes | 37 | 215 |
| Cotton | 20 | 19 |
| Subtropical orchards | 167 | 842 |
| Total | 1,481 | 3,408 |

SOURCES:

CAC reports, various years.

**Table 31. Average Harvested Acres and Production Value, Outside Central Valley Region, 1986-1995**

In terms of harvested acres, alfalfa is the number one crop in the Outside Central Valley Region, accounting for 28% of the region's total harvested acres. The next important crops in the region are pasture (12%), subtropical orchards (11%), field crops (10%), and grains (10%). Other main crops grown in the region include sugar beets and grapes.

Truck crops and orchards together accounted for less than 30% of the total harvest acreage in this region but produced about 70% of the total production value, reflecting high crop values per acre. Pasture, alfalfa, grains, and field crops produced less than 15% of total production value with more than 50% of total harvested acres, indicating lower crop values per acre.

**Farm Profiles.** Numbers and sizes of farms, together with ownership patterns, describe the general structure of agriculture within a region.

Table 32 shows that the number of farms decreased from 21,281 in 1987 to 19,899 in 1992 in the Outside Central Valley Region. The decline was primarily due to loss of farm land (791,000 acres) to industrial and urban uses. The average farm size decreased from 295 acres to 276 acres during this period.

About 80% of farms in the Outside Central Valley Region are operated by full owners, 8% by part owners, and 12% by tenants. Little change occurs in these numbers between 1987 and 1992.

**Agricultural Production Costs and Revenues.** Agricultural net returns are revenues less costs. Higher costs reduce farm profits, but some part of costs also represent farm expenditures in the regional economy. Revenues are price times

production. Farms in the Outside Central Valley Region achieved $3,743 million in agricultural sales in 1987 and $4,295 million in 1992, as shown in Table 33. About two-thirds of these sales were receipts for crops. The remainder of the sales were mostly livestock products. Farmers received an additional $29 million in government payments and direct sales, custom work, and other farm services in 1992.

Production expenses were about $3,510 million in 1992, leaving a net cash return of $814 million. Net cash return includes the payment for family labor, management, returns to land and water, risk, and some other uncounted costs of farming. Hired and contract labor was the largest expense reported, accounting for about 30% of total expenses, and it has been increasing over time. Other large categories (other than livestock-related expenses) were fertilizers and chemicals, petroleum products and electricity, and interest paid.

| | Number and Size | | | Ownership Status | | |
|---|---|---|---|---|---|---|
| Year | Number of Farms | Land in Farms (1,000 acres) | Average Farm Size (acres) | Full Owners | Part Owners | Tenants |
| 1987 | 21,281 | 6,279 | 295 | 16,744 | 1,837 | 2,700 |
| 1992 | 19,899 | 5,488 | 276 | 16,063 | 1,639 | 2197 |

SOURCES:

Census, 1989 and 1994.

**Table 32. Number of Farms, Farm Sizes, and Farm Ownership, Outside Central Valley Region, 1987 and 1992**

| | Total Farm Income (million dollars) | | | Total Production Expenses (million dollars) | | | | | Net Cash Return (million dollars) |
|---|---|---|---|---|---|---|---|---|---|
| Year | Agric. Product Value | Other Revenue | Total | Livestock Related | Fertilizers and Chemicals | Hired and Contract Labor | Other | Total | |
| 1987 | 3,743 | 30 | 3,773 | 872 | 185 | 842 | 1,044 | 2,943 | 830 |
| 1992 | 4,295 | 29 | 4,324 | 904 | 222 | 1,072 | 1,312 | 3,510 | 814 |

SOURCES:

Census, 1989 and 1994.

**Table 33. Farm Income and Production Expenses, Outside Central Valley Region, 1987 and 1992**

## 5.0 References

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